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March 16, 1995

Mr. William F. Caton
Secretary
Federal Communications Commission
1919 M Street, N.W. - Room 222
Washington, D.C. 20554

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MAR 16 1995
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

RE: Ex Parte Material
CC Docket No. 94-1

Dear Mr. Caton:

Attached is information on the economic rates of return realized by the Local Exchange Carriers regulated under Price Caps.

The original and a copy of this ex parte notice are being filed in the Office of the Secretary. Please include it in the public record of this proceeding.

Sincerely,

Mary McDermott
Vice President -
Legal & Regulatory Affairs

cc: Kathleen Wallman
Richard Metzger
Michael Katz
Pete Belvin
Karen Brinkmann
Richard Welch
James Casserly
James Coltharp
Mark Uretsky

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List A B C D E

The Price Cap LECs' Economic Rate of Return for the Price Cap Period

The economic rate of return is the best measure of the price cap LEC's earnings during the price cap period.

The Price Cap LECs[1] have already explained why economic rate of return is the only appropriate measure of their earnings during the price cap period. The economic rate of return on investment is defined as that discount rate which equates the present value of future cash flows from an investment to the initial cost of that investment. It is this return that is relevant to investors. Thus, the economic rate of return is the only rate of return that is directly comparable to the Commission's benchmark 11.25 percent cost of capital. The accounting rate of return, in contrast, is based on: 1) accounting, rather than economic, depreciation; 2) book values rather than economic values; and 3) accrued revenues and expenses rather than cash flows.

Accounting rates of return reflect the effects of accounting and regulatory conventions. such as arbitrary cost allocations, which are not consistent with the measurement of Total Factor Productivity. No legitimate conclusions about productivity can follow from a review of the price cap LEC's accounting rates of return over the price cap period. Total Factor Productivity, in contrast, is a true economic measure of productivity.

The price cap LEC's economic rate of return during the price cap period averaged 8.20 percent.

The attached calculations explicitly translate the economic TFP analyses into an economic rate of return. The resulting economic rate of return is based on the same theoretical foundation that underlies the methods employed in the financial marketplace.

The specific approach in calculating the after tax economic rate of return consists of:

-revenues (less uncollectibles) net of labor and materials expense and all taxes; it also includes capital gains and excludes economic depreciation.

The after tax economic rate of return:

-reflects the opportunity cost of capital and is computed by dividing the after tax economic return by the value of capital stock.

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[1] See (e.g.) Affadavit of Dr. James Vander Weide filed with Bell Atlantic's Reply Comments, June 29, 1994.

-The value of capital stock is the beginning-of-period current value of economic stock. This value is the quantity of economic stock computed by the perpetual inventory method and repriced by telephone plant indexes to reflect current value.

The attached table compares the rate of return set by the FCC and economic returns during the pre-price cap as well as the price cap period. As shown in the data, the economic rate of return during the price cap period decreased by approximately 380 basis points from the average economic rate of return earned prior to the price cap period. In addition, the difference between the average FCC authorized return and average economic return is significantly lower in the price cap years. These data demonstrates that the current productivity offset of 3.3% has not caused increases in earnings. In fact, economic returns have declined significantly as a result of the offset.

United States Telephone Association (USTA)
Analysis of Economic Rates of Return

YEAR	BENCHMARK RETURN	ECONOMIC RETURN
1984	12.75%	12.66%
1985	12.75%	13.12%
1986	12.75%	11.24%
1987	12.00%	10.53%
1988	12.00%	13.18%
1989	12.00%	13.38%
1990	12.00%	9.55%
	ECONOMIC RATE OF RETURN AVERAGE	12.00%
	BENCHMARK RATE OF RETURN AVERAGE	12.32%
1991	11.25%	8.52%
1992	11.25%	7.28%
1993	11.25%	8.72%
	PRICE CAP ROR AVERAGE	8.20%
	BENCHMARK ROR AVERAGE	11.25%

COMPETITION IN THE INTERSTATE LONG-DISTANCE MARKETS: RECENT EVIDENCE FROM AT&T PRICE CHANGES

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Study Director

March 16, 1995

Table of Contents

COMPETITION IN THE INTERSTATE LONG-DISTANCE MARKETS: RECENT EVIDENCE FROM AT&T PRICE CHANGES

Summary and Conclusions

The purpose of this study is to update previous reports that examined the relationship between the prices AT&T pays to local telephone companies for interstate carrier access service and the prices it charges its customers for interstate long-distance service.[1] If the interstate long-distance markets were reasonably competitive, changes in carrier access prices would be passed through to customers as changes in long-distance prices.[2] Carrier access prices have fallen steadily since divestiture, and the extent to which these price reductions have been passed through to long-distance customers in the form of lower prices provides a measure of the degree of price competition in the interstate long-distance markets.[3]

In this paper, we show that regulated competition in the interstate toll market has not yet led to the price reductions that would be expected from vigorous price competition. While prices for some services have been reduced substantially, the price reductions have been caused, in large measure, by changes in carrier access prices. On a per-minute basis, access charges

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[1]W.E. Taylor, "Effects of Competitive Entry in the U.S. Interstate Toll Markets," filed in CC Docket No. 91-141 (August 1991), "Effects of Competitive Entry in the U.S. Interstate Toll Markets: An Update," filed in CC Docket No. 92-141 (July 1992), and W.E. Taylor and L.D. Taylor, "Postdivestiture Long-Distance Competition in the United States," *American Economic Review*, Vol. 83, No. 2, (May 1993), pp. 185-190.

[2]A reduction in carrier access prices lowers the marginal cost of providing interstate services for every long-distance company. In a competitive market, such changes in costs would be ultimately passed through in their entirety to customers in the form of lower prices.

[3]Almost half of the costs that AT&T and other long-distance carriers incur to provide interstate long-distance service are charges paid to local telephone companies to originate and terminate interstate traffic on their networks. These carrier access charges are assessed on each minute of switched access service and on each private line circuit that the long-distance carriers purchase from the local companies. Per minute and per circuit carrier access prices have fallen dramatically since divestiture in 1984, and the Federal Communications Commission (FCC) has required that AT&T pass through these access price reductions to its long-distance customers in the form of lower long-distance prices or reductions in the price cap index. Despite these requirements, consumers have not yet received the full benefit of access charge reductions in the prices they pay for interstate services.

have fallen by about 50 percent since 1984, while long-distance prices have fallen substantially less. The divergence in price and cost reductions has allowed AT&T's per-minute margins to increase on a volume of minutes that is greater than it was in 1984, even though its share of total switched interstate minutes has dropped by about 25 percent over the same period. Evidence from the relationship among price, cost, and AT&T's firm-specific price elasticity of demand suggests pricing behavior utterly inconsistent with price-taking firms in a competitive market.

At the outset, we should be clear on the objective. The goal of the study is to measure the degree of competitive price response in the long-distance market to changes in market marginal costs. A change in carrier access prices is an example of a such a cost change, and we would like to know how, or in what sense, the interexchange carriers have been compelled by competitive forces to flow such cost changes through to customers in the form of price changes. Observe that simply comparing the change in long-distance price per minute with the change in access price per minute does not answer the question satisfactorily. If access charges were reduced by a penny per minute but labor costs rose by a penny per minute, we would not expect interexchange carriers to reduce per-minute prices by a penny. Similarly, if access charges fell a penny per minute while capital costs fell by another penny per minute, a one-cent reduction in price would not fully flow through carrier access reductions to consumers. To determine the likely effect on price--all else equal--of a reduction in access charges, we have to compare historical price changes to <u>all</u> cost changes or compare current price changes to past price changes.

A. Changes in Interstate Long-Distance Prices, Net of Access Price Changes

Our previous studies examined AT&T tariff filings since 1984, aggregating the revenue effects of interstate long-distance price changes and access price changes. We showed that from divestiture in 1984 through July 1992, AT&T reported cumulative annual access charge reductions of $10.131 billion and reductions in other annual costs beyond its control of $0.733 billion, for a total reduction in costs of $10.864 billion.[4] Over the same period, AT&T prices to its customers fell by $8.223 billion per year. Thus, despite the loss of market share, massive advertising and marketing efforts, and active competition for large business customers, competitive pressure in the interstate long-distance markets still permitted AT&T to raise its prices by $2.641 billion per year, net of access charges.

To judge the degree of competition implied by these price changes, we need to know what happened to industry costs other than access charges or what historical rates of change of long-distance prices have been. We showed that AT&T's interstate long-distance prices (net of inflation and separations changes) fell much less rapidly during the 1984-1992 period when compared with the decades before competition and divestiture. From this result, we concluded that interstate toll competition since 1984 "has not led to lower prices in the aggregate market or to lower prices for residential and small business customers."[5]

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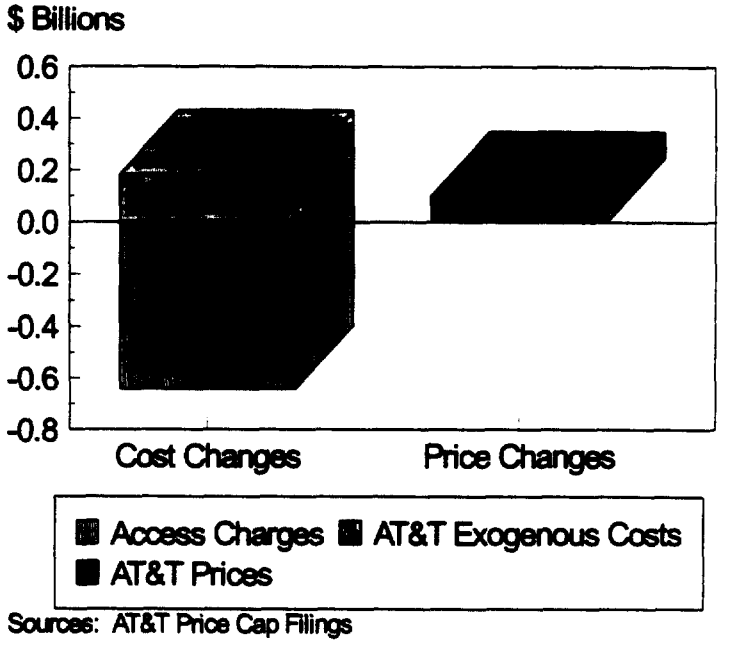
[4]Access charges and exogenous costs are only part of AT&T's total costs. To the extent that AT&T has had to reduce network costs through adoption of new technology and to reduce labor costs through force reductions to meet competition, its incremental costs would have fallen by more than $10.9 billion per year. If realized, these additional cost reductions would appear as an increase in AT&T's margins for long-distance services.

[5]Taylor and Taylor, op. cit., p. 189.

1. Price and Cost Changes

The current study updates our previous results[6] and finds a similar pattern in recent periods. Since the advent of price cap regulation for the local exchange carriers (LECs) in 1991, AT&T has raised prices by $98 million per year, while access charge reductions amounted to $0.644 billion and exogenous cost increases that pertain to the industry were $0.181 billion.[7] In other words, AT&T prices fell by about $561 million (annually) less than access charges and AT&T's industry-specific exogenous costs fell. (See Figure 1.)

Figure 1
AT&T Cost and Price Changes
1991 - 1995



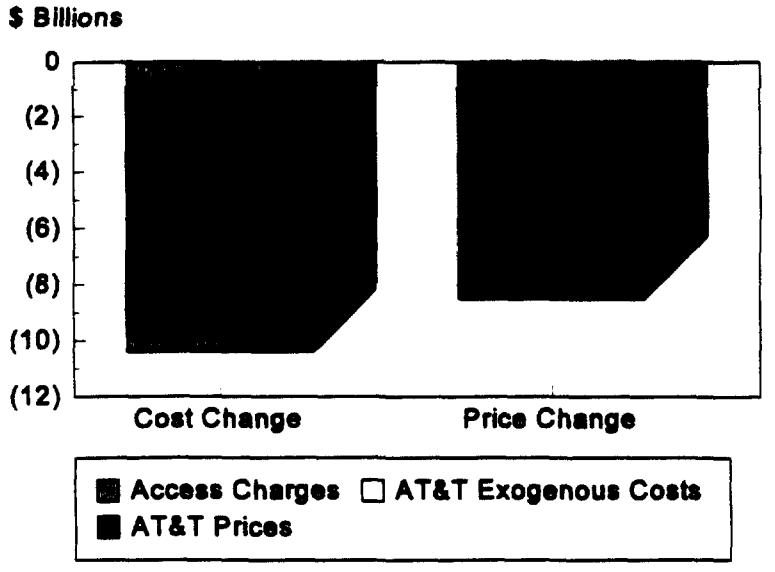
Sources: AT&T Price Cap Filings

Since divestiture, AT&T has reduced its prices by $8.521 billion, while its access charge expenditures fell $10.299 billion and its exogenous costs dropped by $103 million. (See Figure 2). Over the entire period, AT&T's price reductions were less than its access charge

[6]My analysis includes AT&T price cap filings through Transmittal No. 8174, filed on February 16, 1995, to be effective on April 2, 1995.

[7]Only exogenous cost changes that apply equally to all firms in the industry could be passed through in long-distance price changes in a competitive long-distance market.

Figure 2
AT&T Cost and Price Changes
1984 - 1995



Sources: AT&T Price Cap Filings

and exogenous cost reductions by $1.881 billion.

This simple measure of the pass-through of access charges has two advantages: (1) it is reasonably simple to calculate; and (2) it is familiar to utility analysts, who routinely express price changes in terms of the annual revenue changes they engender. Prior to price cap regulation, the FCC staff and AT&T performed a similar analysis to measure AT&T's historical real rate of price growth (net of access charge and exogenous cost changes). Our pre-1989 measurements generally agree with those of the FCC Staff and AT&T.[8] Under price caps, the calculation of AT&T's actual price index (API) for each basket supplies all of the necessary information to calculate annual revenue and cost changes associated with toll access price changes.

[8]Policy and Rules Concerning Rates for Dominant Carriers, Report and Order and Second Further Notice of Proposed Rulemaking, CC Docket No. 87-313, 4 FCC Rcd 2994,2996 and 3335,3341 (1989).

2. A Formal Laspeyres Price Index

As part of its price cap filings, AT&T provides information that can be used to construct conventional aggregate access price and output price indices. These indices are specific to AT&T's mix of services and network structure, and they include the effect of new service offerings on demand.[9] In the price cap filings, AT&T estimates the dollar amount by which its switched access expenses will be reduced for price-capped services measured using a base level of demand (from the previous year).[10] From this data, we have constructed an index of access cost and prices for AT&T starting from a base of 100 in 1984. The resulting indices for the post-price cap period (1989 and after) are chain-linked Laspeyres price indices for AT&T-purchased access services and AT&T output for products under price caps.[11] The price indices are Laspeyres because they use base period quantities in weighting and chain-linked because the bases are changed each year to reflect substitution in the mix of outputs. In the pre-price cap period, weights cannot be calculated from publicly-available data. Hence, we began in 1989 with weights from the price cap filing, and adjusted the weights in each previous year to construct a chain-linked Paasche price index for the pre-price cap period.

Using these indices, it is straightforward to confirm our previous findings that nominal toll prices net of access prices have grown in both the post-divestiture and LEC price-cap periods. The computed toll and access price indices are displayed in Figure 3. Nominal toll and access prices declined at annual rates of 2.5 and 8.0 percent, respectively, between 1984 (3rd quarter) and 1994 (4th quarter), while they changed at annual rates of +0.1 and -2.3 percent,

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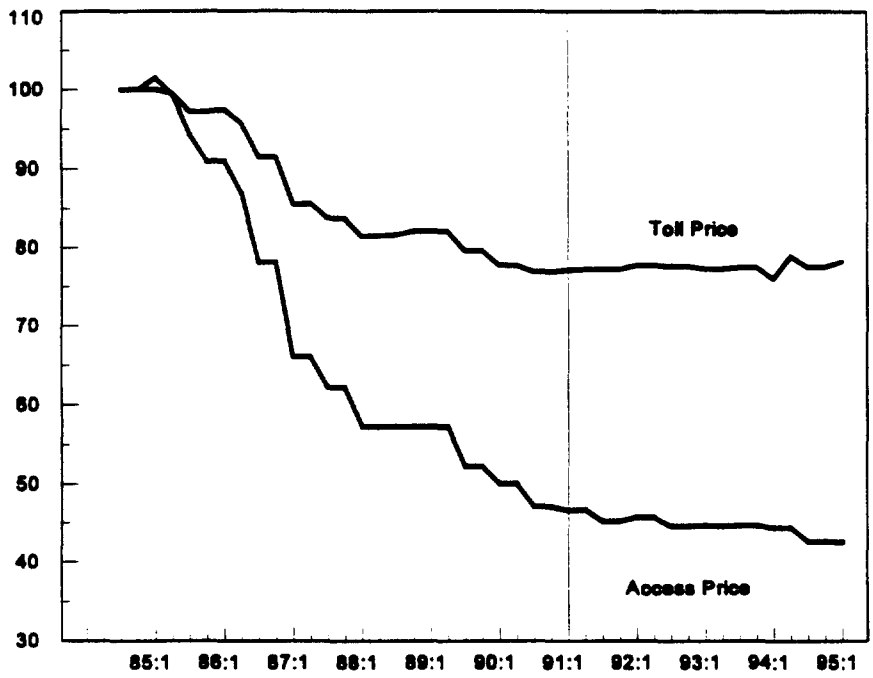
[9]See, e.g., attachment to letter from M.F. Del Casino, AT&T Administrator - Rates and Tariffs to W.F. Canton, Acting Secretary, FCC dated May 17, 1994, p. 3, or 47 CFR 61.44(g), 61.46(b), 61.47(b).

[10]Ibid, p. 5.

[11]See, e.g., Deaton, A. and J. Muellbauer, Economics and Consumer Behavior, Cambridge, 1980, p. 170.

respectively, in the 1991-1995 price cap period. Net of access charges, toll prices increased by 1.1 and 0.7 percent annually in the post-divestiture and LEC price cap eras, respectively.[12]

Figure 3
AT&T Toll and Access Price Indices



Under LEC price cap regulation, our results show that a price index of AT&T services fell by a smaller amount than AT&T's marginal costs from access charges and industry exogenous costs. From these results, it is apparent that the combination of competition in the interstate long-distance markets and price cap regulation of AT&T has not produced vigorous price competition, particularly in the residential long-distance market. Net of AT&T's claimed access charge changes and market exogenous cost changes, interstate prices have risen during the LEC price cap period. Thus, the benefits of lower prices and expanded demand for interstate switched services that are sometimes ascribed to competition should be properly attributed to the regulatory policies that have lowered access charges: in particular, subscriber line charges, separations reform, and--during the AT&T price cap period--the implementation of price cap regulation for LEC access services.

[12]The slower rate of reduction of carrier access charges under price cap regulation is due to the facts that subscriber line charges and major separations rules were essentially unchanged under price caps but had reduced carrier access charges significantly from 1984 through 1988.

B. Average Revenue per Minute, Net of Access Charges

Alternative methods have been proposed to measure the effects of access charge changes on consumer long-distance prices.[13] Instead of calculating indices of prices, these methods use average revenue per minute (ARPM) and average access cost per minute (AAPM) as surrogates for long-distance and carrier access prices. The rate of growth of the difference between these series is then taken as an indicator of the degree of price competition in the market.

1. Theory

To understand the relationship between these alternative measures and the price indices discussed above, two observations from the theory of index numbers will be helpful. First, despite a long history of attempts to measure the effect of price changes on consumer welfare,[14] there remain three unresolved index number issues: the treatment of (i) new products; (ii) quality changes; and (iii) changes over time in consumers' tastes for specific products.[15] Any application of index number theory (including price or cost indices and changes in average revenue per minute) will be subject to one or more of these shortcomings.

Second, changes in average revenue per minute do not constitute a price index in the traditional sense. Deaton and Muellbauer explain:

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[13]See, e.g., R. Hall, "Long Distance: Public Benefits from Increased Competition," Applied Economics Partners, Menlo Park, California, October 1993; M. Seivers, "Should the InterLATA Restrictions be Lifted? Analysis of the Significant Issues," presented at Rutgers University Advanced Workshop in Regulation and Public Utility Economics, 7th Annual Western Conference, July 6-8, 1994; or D.L. Kaserman, Reply Testimony on behalf of AT&T Communications of Pennsylvania, Inc., Docket No. I-00940034, February 23, 1995, p. 6.

[14]See, e.g., Diewert, W.E., "The Early History of Price Index Research," *NBER Working Paper 2713*, September 1988.

[15]See, e.g., Fixler, "The Consumer Price Index: underlying concepts and caveats," *Monthly Labor Review*, December 1993, pp. 3-12.

> In the context of consumers, economic index numbers attempt to construct a single ratio that measures one of two things. The first, the cost-of-living index, measures the relative costs of reaching a given standard of living under two different situations, while the second, the real consumption index, compares two different standards of living in some appropriate units.[16]

A change in ARPM neither measures the relative costs of reaching a certain standard of living nor compares two standards of living. ARPM mixes both issues together, using different patterns of consumption and/or different prices in each period.

As an example of the kind of errors that can arise from using ARPM as a price index, suppose AT&T customers demand ten minutes of message toll service (MTS) for each minute of wide area toll service (WATS) (and no other products) and that the price of MTS (per minute) is twice that of WATS. If MTS and WATS prices increase slightly but demand for WATS grows at 50 percent per year while MTS demand grows at 10 percent per year, then the ARPM of usage declines by slightly less than two percent. ARPM declines despite the fact that both of the component usage prices have increased.[17]

A similar problem arises in the context of volume discount plans. Suppose the prices in the plan remains fixed, but customers are able to receive lower effective marginal prices when their demand expands (e.g., because they have installed fax machines). In that case, ARPM would decline not because the price of usage declined, but because customer demand increased.

ARPM will also overstate the effect of a price change if the own-price elasticities for different services are different, even when the percentage price change for each of the services

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[16]See, e.g., A. Deaton and J. Muellbauer, op. cit., p. 169.

[17]This effect is not merely a theoretical possibility. According to AT&T's 1994 Annual Report, "Although we raised prices on basic services over the past two years, the shift in the mix of services that customers selected reduced average per-minute revenues in 1994 and 1993" (at 24). In contrast, Professor Hall claims that ARPM for AT&T is not affected substantially by changes in the mix of services demanded (at 7, footnote 3). There is no documentation supporting this assertion, and it seems obvious that these kinds of differential service growth rates occur frequently in telecommunications. He suggests later that MCI and Sprint have been "particularly successful" in selling services which bypass LEC access facilities (at 24). If they have been "particularly successful" because customers' tastes for these kinds of services have shifted, then ARPM overstates the effect of any price change.

is identical. For example, suppose (i) the price of service A is one dollar per minute, ten minutes are sold, and the A own-price elasticity is -0.2, and (ii) service B has a price of fifty cents per minute, a demand of ten minutes and an own-price elasticity of -5.0. If each of the service prices decreases by 10 percent, ARPM will decrease by 17 percent. In this case, a change in ARPM overestimates the extent of the price change by about a factor of two. Note that the problem does not arise through substitution--the demands for the products are independent in this example--but rather because of the inadequacies of the index itself.

The same criticisms of ARPM would affect an average access per minute (AAPM) statistic. If consumers' tastes for bypass services (for example, because of improved reputations and recognition of alternative access providers) change over time, then AAPM will be similarly biased as a measure of access price change. We would, however, expect AAPM to be less susceptible to the infirmities described above since access charges are not differentiated by customer type.

2. Comparisons of the Indices

Calculating ARPM net of access charges for AT&T or the aggregate of interexchange carriers is a difficult procedure; indeed, an impossible one using data confined to the public record. Oddly, in this regulated industry, there is no available measure of AT&T or industry-wide switched conversation minutes of use (interstate, intrastate or total) or interstate revenues from switched services. Switched carrier access minutes are available for AT&T and the industry, but the growth of bypass (or services such as Megacom) makes interstate carrier access minutes a poor measure of the demand for interstate switched services. As a result, the

components of ARPM (even in the aggregate) and access expenditures per conversation minute are unknown, and debates concerning their magnitude are not likely to be useful.

Some limited comparisons, however, can be made. First, our previous studies used an AT&T estimate of the annual price effect of customer migration to high-volume services to adjust our estimated price changes towards the concept measured by ARPM. In its price cap review filing, AT&T used the fact that during the 1989 - 1991 period, prices actually paid by AT&T customers fell at an annual rate of 0.9 percent due to migration to lower-priced services such as SDN.[18] If we assume conservatively that migration occurred at this rate throughout the period, our estimate of the annual growth of AT&T prices overstates the annual growth in AT&T's average revenue per minute by about 0.9 percentage points. Adjusting our estimates downward, we still find that AT&T price decreases (adjusted for migration to lower-priced services) remain less than the decreases in AT&T's access charge expense.

Second, AT&T developed and placed on the public record, an extensive, detailed series of interstate MTS price indices that it used to forecast test period demands for interstate switched access minutes of use as part of the LECs' annual access charge filings.[19] The price changes in these indices are the ones which consumers use to determine their consumption of telecommunications services. This price index agrees quite closely with our chain-linked Laspeyres index and tells a very different story from the ARPM measures of Professor Hall. AT&T's price index includes data through 1989, at which point the price cap program rendered

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[18]R. Schmalensee and J. Rohlfs, "Productivity Gains Resulting from Interstate Price Caps for AT&T," report filed by AT&T in CC Docket No. 92-134, September 3, 1992, Table II.

[19]See AT&T, In the Matter of 1990 Annual Access Charge Filings, Before the Federal Communications Commission, April 27, 1990, Appendix B, Figure 10, various states. The price indices vary across states because of differences in traffic mix, length of haul and time of day distributions.

such demand forecasts unnecessary. The comparison between Professor Hall's prices and our own Laspeyres index is shown in Table 1, below.

Table 1
Nominal Toll Prices
1985 and 1989

Year	Professor Hall	AT&T Price Index	NERA Laspeyres Index of AT&T	Adjusted Interstate Toll CPI
1985	100.0	100.0	100.0	100.0
1989	59.2	75.2	78.2	76.0

This table compares the percentage decline in nominal toll prices from four sources: (1) Professor Hall's study;[20] (2) the AT&T interstate price index[21]; (3) our Laspeyres price index; and (4) the CPI interstate toll price index, adjusted by 0.9 percentage points per year to account for migration to high-volume services.[22] All series are normalized to 100 in 1985. The table shows that Professor Hall's 1989 prices are substantially lower than the other series. The

Table 2
Correlation Matrix (All Years)
Price Levels

	API	Hall	L. Index	AT&T	CPI
API					
Hall	0.976				
L. Index	0.995	0.983			
AT&T		0.982	0.996		
CPI	0.962	0.974	0.997	0.997	

[20]Hall, op.cit., Data Appendix, Figure 4, first column.

[21]AT&T, In the Matter of 1990 Annual Access Charge Filings, Before the Federal Communications Commission, April 27, 1990, Appendix B, Figure 10, Illinois prices.

[22]Schmalensee and Rohlfs, op. cit., Table II.

pattern of price changes in these indices is also revealing. Table 2 shows correlation coefficients between AT&T's average price index (API) from Basket 1 of its price cap filings,[23] Professor Hall's price index, the Laspeyres price index ("L. Index") we computed above, AT&T's price index from their access demand proceedings, and the Bureau of Labor Statistics (BLS) Consumer Price Index for Interstate Toll services. Table 3 shows the correlation coefficients between the annual growth rates in these indices. These correlation coefficients show that the price index that AT&T selected for its modeling efforts is highly correlated with the BLS price index and the price index we computed. Even the levels of correlations in growth rates suggest that the indices measure the same market conditions. On the other hand, the correlation coefficient for Professor Hall's ARPM-based price index measured with respect to AT&T's own filed price index is 0.7, which is quite low.

Table 3
Correlation Matrix (All Years)
Growth Rates

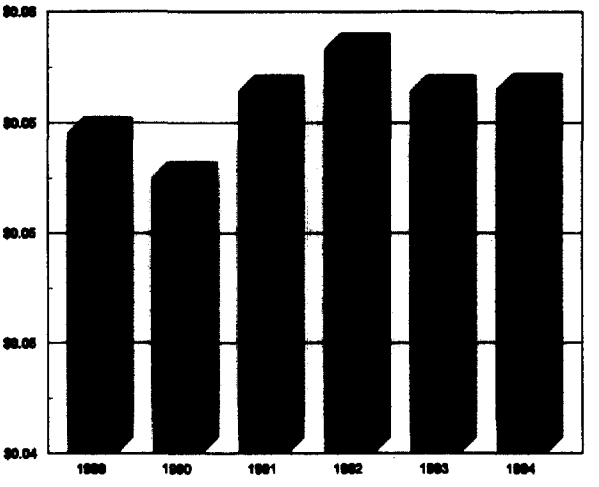
	API	Hall	L. Index	AT&T	CPI
API					
Hall	0.993				
L. Index	0.986	0.788			
AT&T		0.705	0.989		
CPI	0.768	0.816	0.957	0.996	

A second comparison may be useful, based on AT&T's ARPM data calculated from publicly-available data in the price cap filings. Revenue and access expense are reported in each of AT&T's price cap filings. We can then calculate from these an average Basket 1 revenue per switched access minute and an average Basket 1 access expense per switched access minute. On

[23]Adjusted, or not, for migration to high-capacity services. The adjustment would not affect the correlations.

average, ARPM less AAPM rose about 0.7 percent per year over the 1989 - 1994 period. These results are shown in Figure 4.

Figure 4
ARPM Net of Access Charges Increased for Basket 1



C. Conclusions

A comparison of price or ARPM indices for toll and carrier access is not the best measure of the likelihood that future access charge reductions will be passed through to interstate ratepayers. A proper analysis must take into account changes in costs other than access and the relationship over time between changes in costs and changes in prices. In a more detailed analysis, we discuss other measures of market power in the interstate toll market and conclude that while effective competition in long-distance markets could have produced very large consumer benefits, only a fraction of those potential benefits have been realized. In addition, producer benefits (economic profits) have increased during a period of allegedly increased competition, flowing benefits of cost and access charge reductions to interexchange company stockholders rather than customers. AT&T's margins have increased, and it collects those margins on all new minutes stimulated by the price reductions caused by access charge reductions. According to the 1994 AT&T Annual Report.

> (t)otal cost of telecommunications services declines...despite higher volumes, in part because of reduced prices for connecting customers through local networks. In addition, we improved our efficiency in network operations, engineering and operator services. With lower costs and higher revenues, the gross margin percentage rose to 41.8% in 1994 from 39.0% in 1993 and 37.2% in 1992 (at 24).

In short, regulated interstate competition has not yet brought the substantial reductions in prices that would be expected to arise from vigorous toll competition combined with considerable reductions in costs.

Changes in Carrier Access Charges
and
Changes in AT&T Interstate Toll Rates
($ Millions)

	Access Charge Changes	Other Exogenous Cost Changes	Access & Cost Changes	Cum. Cost Change	AT&T Rate Changes	Difference	Cumulative Rate Changes
05/25/84	($1,400)	$0	($1,400)	($1,400)	($1,400)	$0	($1,400)
01/15/85	$274	$0	$274	($1,126)	$0	($274)	($1,400)
04/26/85	$0	$0	$0	($1,126)	$303	$303	($1,097)
06/01/85	($1,157)	$0	($1,157)	($2,283)	($1,157)	$0	($2,254)
10/01/85	($525)	$0	($525)	($2,808)	$0	$525	($2,254)
01/01/86	$0	$0	$0	($2,808)	($135)	($135)	($2,389)
01/11/86	$25	$0	$25	($2,783)	$248	$223	($2,141)
02/28/86	$0	$0	$0	($2,783)	$17	$17	($2,124)
04/15/86	$0	$0	$0	($2,783)	$72	$72	($2,052)
06/01/86	($2,000)	$0	($2,000)	($4,783)	($2,000)	$0	($4,052)
01/01/87	($1,865)	$0	($1,865)	($6,648)	($1,865)	$0	($5,917)
03/13/87	$0	$0	$0	($6,648)	$18	$18	($5,899)
07/01/87	($593)	$0	($593)	($7,241)	($593)	$0	($6,492)
12/01/87	$0	$0	$0	($7,241)	$77	$77	($6,415)
01/01/88	($772)	($524)	($1,296)	($8,537)	($772)	$524	($7,187)
06/17/88	$0	$0	$0	($8,537)	$28	$28	($7,159)
09/17/88	$0	$0	$0	($8,537)	$174	$174	($6,985)
07/01/89	($776)	$0	($776)	($9,313)	($785)	($10)	($7,770)
01/01/90	($385)	($141)	($526)	($9,839)	($595)	($68)	($8,365)
07/01/90	($482)	($1)	($483)	($10,322)	($253)	$229	($8,618)
01/01/91	($130)	$0	($129)	($10,451)	$22	$151	($8,597)
02/01/91	$47	$0	$47	($10,404)	$63	$16	($8,534)
02/21/91	$11	$0	$11	($10,393)	($10)	($21)	($8,544)
07/01/91	($251)	($9)	($260)	($10,652)	$9	$268	($8,535)
01/01/92	$97	($25)	$73	($10,580)	$138	$66	($8,397)
07/01/92	($165)	$107	($58)	($10,638)	($41)	$17	($8,439)
01/01/93	$60	$0	$60	($10,578)	($78)	($138)	($8,517)
02/03/93	($58)	$0	($58)	($10,636)	$0	$58	($8,517)
07/01/93	$15	$281	$296	($10,340)	$40	($256)	($8,477)
01/01/94	($34)	$11	($22)	($10,362)	$329	$352	($8,147)
07/01/94	($223)	($69)	($292)	($10,654)	($327)	($35)	($8,474)
08/01/94	$0	$228	$228	($10,426)	$20	($209)	($8,455)
08/15/84	$0	$56	$56	($10,370)	$0	($56)	($8,455)
11/18/94	$0	($27)	($27)	($10,397)	($19)	$8	($8,474)
01/01/95	($13)	$0	($13)	($10,410)	$0	$13	($8,474)
01/15/95	$0	$8	$8	($10,402)	$196	$188	($8,278)
02/06/95	$0	$0	$0	($10,402)	$19	$19	($8,259)
03/27/95	$0	$0	$0	($10,402)	($583)	($583)	($8,842)
04/02/95	$0	$0	$0	($10,402)	$321	$321	($8,521)
TOTALS	($10,299)	($103)	($10,402)	($10,402)	($8,521)	$1,881	($8,521)
1/91-4/95	($644)	$563	($80)	($80)	$98	$178	$98

Changes in Exogenous Costs

	Market Cost Changes				AT&T-Specific Cost Changes				
	Tax	COCOT	ADA-TRS	OBRA (fees)	Depreciation	COMSAT	FAS 106	FAS 112	Asset Write Down
18-Dec-89					($141.4)				
28-Jun-90	($1.4)				$0.6				
18-Dec-90	$0.5								
17-May-91	$30.8								
28-Jun-91						($39.7)			
19-Dec-91					($24.8)				
15-May-92	$72.9	$10.4			($0.4)	$26.9			
30-Jun-92	($2.7)								
17-May-93	$38.1								
30-Jun-93							$242.9		
17-Dec-94			$11.5						
17-May-94	$9.7	$3.6	($1.5)	$3.2	$0.6		-81	231.1	
30-Jun-94				($3.2)	($1.2)			-231.1	
01-Aug-94								296.7	
11-Aug-94									-12
18-Nov-94								-27	
19-Dec-94				$7.8					
Total	$147.9	$14.0	$10.0	$7.8	($166.6)	($12.8)	$161.9	$269.7	($12.0)
1/91 - 12/94	$148.8	$14.0	$10.0	$7.8	($25.8)	($12.8)	$161.9	$269.7	($12.0)

Market 89-94	$171.9	Market 91-94	$180.6
AT&T-specific	$240.2	AT&T-specific	$381.0
Total	$412.1	Total	$561.6